July 30, 2018

Expert Report of Todd MacKenzie, PhD

I. Purpose

The Department of Justice retained me to provide statistical expertise in the design and selection of a sample of individuals who had been civilly committed to a State Hospital in Mississippi one or more times between October of 2015 and October of 2017. The sample was drawn in preparation for a clinical expert review. The goal was to draw a random, representative sample of patients admitted to Mississippi state hospitals. The key statistical concepts utilized in the design of the sample were randomness, stratification, and weighting.

II. Expert Background and Qualifications

I am a Professor of Biostatistics in the Department of Biomedical Data Science at Dartmouth College. I received a Bachelor's degree, majoring in Statistics, from Dalhousie University (Halifax, Canada) in 1990, a Master's degree in Statistics from McGill University in 1993, and a PhD in Statistics from McGill University in 1997. My employment as a statistician began in 1988 at Montreal General Hospital, where I worked full- and part-time until the completion of my doctoral training. Between 1997 and 2002, I was an Assistant Professor in the Department of Biometrics and Preventive Medicine at University of Colorado. In 2002, I joined the Department of Medicine at Dartmouth College as an Assistant Professor. I was promoted to Associate Professor in 2006. In 2012, I became one of the inaugural faculty members of the Department of Biomedical Data Science at Dartmouth College in which I was promoted to Full Professor with Tenure in 2016.

I have been a co-author on over 220 publications in peer-reviewed journals, in which I applied statistical expertise or proposed statistical methods. I have been a co-investigator on dozens of externally awarded grants on which I led statistical design and analysis. I have been the statistical representative on the data monitoring committee of several national studies, and sat on numerous national grant review committees. I have reviewed hundreds of manuscripts as a reviewer and editor, including 50 manuscripts submitted to *The Lancet*. About 20% of my time is dedicated to teaching. Over the past two years I have led the effort at Dartmouth College to design a new Master's degree in Health Data Science for which we received 75 applications for the inaugural class commencing this September.

I have guided the statistical design and analysis of hundreds of studies. This includes randomized trials, clinical trials of all phases, cohort studies, case-control studies and surveys. Each study is designed to satisfy statistical principles including generalizability, accuracy and precision. This will be the first time I provide Expert Testimony. Additional details on my background and qualifications can be found in my Curriculum Vitae, attached hereto as Exhibit A, which includes a complete list of publications I have authored during the past 10 years. I was compensated at a rate of $150.00/hour for my work on this matter, including expenses. My compensation is not contingent on the outcome of this matter.

III. Facts and Data Reviewed

A complete list of the materials I considered is attached hereto as Exhibit B. I relied on the data available to the Department of Justice as of Dec 06, 2017.

IV. Methodology

A. Sample Unit

The sampling unit used was individuals with mental illness who were civilly admitted to a Mississippi State Hospital between October 2015 and October 2017.

B. Construction of the Sample Frame

The Department of Justice received files from the State of Mississippi with the list of patients admitted to one of the four mental health state hospitals during the two-year period between October 2015 and October 2017. Each row of each file represented one admission for one individual.

Before analyzing a data set, it is standard practice to "clean" the data by identifying missing or possibly implausible (mistaken) values, including inconsistencies between values. The cleaning begins with tabulations of missing data and descriptive statistics for the non-missing data such as distributions and frequencies. Note: Descriptive statistics are values that characterize a distribution such as the mean, median or other percentiles, proportions, standard deviations or visual displays such as histograms. A common approach is to exclude records which are missing crucial information or contain clear errors[1]. I examined the list of patients provided by the State of Mississippi and excluded records meeting any of the following criteria: 1. Admissions for whom the patient name, birthdate, social security number, or admission date were missing. 2. Admissions for which the admission date was lacking or after the last date of the two year period, or was after the listed discharge date. 3. Admissions for which the primary treatment unit was a chemical dependency unit. The latter criteria was because this list of patients was mistakenly provided to the DOJ; individuals whose primary treatment was for chemical dependency were not the intended focus of the clinical review.

After the cleaning process and resulting exclusions I conducted descriptive statistics to characterize the population in terms of gender, age, race, diagnoses, number of prior admissions, and length of stay. The descriptive statistics of the sampled population are attached as Exhibit C.

The patient lists provided by the State of Mississippi were defined at the admission level, meaning that some individuals were represented more than once on the lists because they were admitted more than once during the two-year period. I defined the sampling frame to be the 3951 unique patients, and removed duplication of patients within the 5070 admissions by using the first admission for each individual during the two-year period to create the sample frame.

[1] Data Wrangling with R (Use R!/Springer) 1st ed. 2016 Edition by Bradley C. Boehmke Ph.D

Limiting the sample frame to unique patients allows us to generalize findings to individuals who were admitted at least once during the two-year period,

C. Stratification of the Sample

The sample was stratified by two variables: 1) length of stay, and 2) hospital of admission. These two variables were chosen for stratification after consultation with the lead clinical review expert. Stratification is a key concept in statistics that I have applied in dozens of designs. Stratification is defined with respect to one or more characteristics (variables). Study designs incorporate stratification to improve generalizability or to improve accuracy within selected strata[2]. For instance, a survey will stratify a sample with respect to a categorical variable (e.g. race) to ensure that a pre-specified number of subjects are sampled within each category. Likewise, cohort (longitudinal) studies employ stratification to ensure the cohort consists of a pre-specified number of individuals within each strata. A randomized trial may stratify the randomization to ensure that within each strata there is an equal number of subjects in each arm of the trial.

I used four length of stay strata: 1) length of stay equal to 20 days or less; 2) length of stay equal to 21-60 days; 3) length of stay equal to 61-180 days; and 4) length of stay of more than 180 days. Within each of these four strata I sampled 75 patients. The stratification had a second stage: Within each of these four length of stay categories I sampled patients from the four hospitals in proportion to their representation on the entire list. This avoided the possibility that one or more of the samples from each of the four strata would not be representative with respect to each of the 4 state hospitals.

D. Generation of the Sample

We were limited to a maximum sample of 300 patients by the court. We anticipated that many sampled patients would be unreachable or decline to participate in the review. The following table shows the largest possible margin of error we expected for a variety of scenarios for the final realized sample size.

Table of Precision of Estimates Resulting from a Completed Sample of Given Size from each Strata

Pts per strata	Total Pts	Margin of Error for 95% Confidence
60	240	7.2
50	200	7.9
40	160	8.8
30	120	10.4

The margin of error is an interval around the statistic which is likely to contain the actual value. A 95% confidence interval contains the actual value 95% of the time. That is, there is a 5% chance it does not contain the true value. For example, in polls a random sample of the population is taken. The poll's results are subject to random variation since different samples lead to different results. The margin of error quantitates the level of inaccuracy due to random variation. The margin of error decreases as the sample size increases.

[2] Kish, Leslie. "Survey sampling" (1965) Wiley classics

The margins of error in the chart above were calculated taking into account the stratified sampling scheme, of equal numbers of subjects from each of the four categories for length of stay in days, 1-20, 21-60, 61-180, 181+, for which the respective frequencies in the population of patients who stayed in a state hospital during the period Oct 2015 to Oct 2017 were 33%, 43%, 16% and 8%. Accordingly the margin of error is 1.96*sqrt((0.33^2 * p1(1-p1)/n1 + 0.43^2 * p2(1-p2)/n2 + 0.16^2 * p3(1-p3)/n3 + 0.08^2 * p4(1-p4)/n4) where pi is the frequency of interest in strata i and ni is the number of subjects sample from strata i. The table above sets the sample sizes per strata to be equal and assumes the most conservative (highest possible variance) value for the p's, p1=p2=p3=p4=0.5.

I used a random number generator, runif(), in the statistical software R version 3.3.1, to randomly sample 75 subjects from each of the four strata of the sampling frame. The "seed" for the random number generation was chosen based on the first 4 decimals of the time in seconds when I invoked the system time using the R command Sys.time() on December 11, 2017.

Randomness was employed to avoid bias due to systematic selection. Randomized sampling ensures that the sampled individuals are representative of the entire population (Kish, 1965) and not necessarily a subpopulation (e.g. those responding to an advertisement for participants).

Within each length of stay strata, I randomly sampled without replacement from each of the four hospitals by sampling a number of patients in direct proportion to the number of patients in that strata from that particular hospital. For example, among the 1306 patients whose first admission was 20 days or less, 69 or 5.2% were from Eastern Mississippi State Hospital. Therefore in our sample of 75 patients with stays of 20 days or less we restrict it to have 75*0.052=3.9 or 4 patients from EMSH. This stratified random sample of patients was provided to DOJ as a spreadsheet representing information including patient identifiers on all admissions from those patients during the two-year period. The review team was instructed to continue searching for and seeking interviews with individuals on the list until 50 are interviewed per strata.

E. Analysis of the Completed Interviews

Interviews were completed on 154 patients, including four deceased patients for whom a relative was interviewed. A further 20 interviews were conducted but information was not provided in time for the analysis. The number of completed interviews were 36, 37, 38 and 43 respectively within the four length of stay strata, 1-20 days, 21-60, 61-180, 181+. The frequency of interview completion did not vary between the length of stay strata ($p>0.10$) or the four hospitals ($p>0.10$).

I conducted analyses to determine if interview completion among the 300 sampled individuals was associated with gender, race, age, diagnosis and number of prior admissions. Race was significantly associated ($p=0.02$) with being interviewed: Among the Caucasians in the sample, 41.0% were interviewed compared to 57.3% of African Americans.

Thus with the exception of race the completed interviews on the 154 patients is representative of the inpatients of Mississippi state hospitals during the period Oct 2015 to Oct 2017. To overcome the imbalance in race between the sample and the population, weighting is used. For instance, we weight the patients who were sampled according to race, hospital, as well as length of stay to reflect the 2015-17 inpatient population. Weighting, and in particular, inverse probability weighting is a statistical method implemented at the analysis stage. I have employed weighting in dozens of statistical analyses including the analysis of national surveys (NHANES, MEPS), to deal with non-response in convenience samples or loss to follow-up in cohort studies, and comparative effectiveness studies (using inverse propensity weighting).

I characterized responses to each of the three yes/no questions, "Is not opposed to community-based services?", "Would have avoided or spent less time in a state hospital?" and "Is at serious risk of institutionalization in a state hospital?" by reporting the frequency with which they were responded to in the positive ("yes") using the weights based on the pre-sample choices to stratify randomization by length of stay strata and hospital, as well as race because it was found that African Americans were more likely to be interviewed than Caucasians.

Question 1: Whether the individual is not opposed to community –based services

Of the 150 individuals for whom there was responses to the first question, 149 were not opposed to community-based services. The estimate of the frequency is 99.4% with a 95% confidence interval of 98.0% to 100%. The 95% confidence interval is the range that contains the population value with 95% confidence.

Question 2: Whether the individual would have avoided or spent less time in a state hospital

Of the 154 individuals for whom there was responses to the question, all 154 would have avoided or spent less time in a state hospital. The estimate of the frequency is 100% (95% confidence interval of 98.0% to 100% using an exact binomial approach).

Question 3: Whether the individual is at serious risk of institutionalization in a state hospital

Of the 122 individuals for whom there was responses to the question, 104 were at serious risk for institutionalization in a state hospital. The estimate of the frequency is 86.4% (95% confidence interval of 80.2% to 92.7%).

Note that the margins of error presented directly above (the half width of the confidence intervals) are much smaller than the margins of error presented in the sample size justification (see Table in section D). This is due to the fact that the Table in section D presented the highest possible margin of error for a given sample size which occurs when a frequency equals 50%, whereas the margin of error reduces and approaches zero as the frequency moves toward the extremes (100% or 0%). In other words, the high number of yes responses to each question narrowed the margins of error presented here from the expected margin of error, which was derived from the conservative assumption that the number of yes responses to each question would be equal to the number of no responses.

F. Summary

The stratified random sample provides a representative sample of Mississippi State Hospital patients within each strata. The subsample of patients who were interviewed resembled those who were not interviewed with the exception of race. By calculating statistics on the sample of patients with completed interviews using weighting that accounts for length of stay, hospital as well as race we are able to report estimates that are unbiased. In other words, they are representative of the actual value were the entire population to be interviewed.

Todd A

July 30 '19

Respectfully Submitted
Todd MacKenzie, PhD

Todd MacKenzie, PhD

Spring 2018

Home: 1128 Union Village Road, Norwich, VT, 05055 Phone: (802) 649-3092	Office: Rubin 880 DHMC, Lebanon, NH, 03756 Phone: (603) 653-3542 Fax: (603) 653-9093

Education

DATE	INSTITUTION	DEGREE
1990	Dalhousie University, Halifax, Canada	BSc – Math & Statistics
1993	McGill University, Montreal, Canada	MSc – Statistics
1997	McGill University, Montreal, Canada	PhD – Statistics

Academic Positions

DATE	INSTITUTION	TITLE
1997-2002	Department of Preventive Medicine & Biometrics, University of Colorado Health Sciences Center, Denver, CO	Assistant Professor
2002-2006	Department of Medicine, and Community and Family Medicine, Dartmouth Medical School	Assistant Professor
2006-2016	Department of Biomedical Data Science, of Medicine, of Community and Family Medicine, Geisel School of Medicine, The Dartmouth Institute, Dartmouth College	Associate Professor
2016-current	Department of Biomedical Data Science, Dartmouth	Professor

Consulting and Other Work

DATES	ORGANIZATION	Role
2005 - 2008	GlaxoSmithKline	Statistical Consultant
2013 - 2014	National Parkinson's Foundation	Statistical Consultant
Dec 2017 - current	Catholic Health Services of Long Island	Statistician
Oct 2017 – Aug 2018	Department of Justice	Expert Witness / Statistician

Teaching

DATES	INSTITUTION	COURSE TITLE	ROLE	HOURS/YEAR
1998-2001	Biometrics Program, University of Colorado	Biom 6631: Statistical Theory	Director	40
2004-2009	The Dartmouth	CECS 245:	Co-director (1/2)	40 * (1/2)

	Institute, Dartmouth College	Advanced Statistical Methods		
2008-2011	Program in Experimental and Molecular Medicine, Dartmouth College	PEMM 107: Biostatistics	Director	30
2007-2016	MD-PhD Program, Dartmouth College	PHAR 602: Clinical Investigation	Director	15
2013-2018	Quantitative Biomedical Data Sciences, Dartmouth College	QBS 121: Foundations of Biostatistics II	Co-director (1/2)	40 * (1/2)
2013-2014	The Dartmouth Institute, Dartmouth College	Methods for Health Services Research	Instructor (1/3)	40 * (1/3)
2013-2018	The Dartmouth Institute, Dartmouth College	Practice of Statistics in Medicine	Co-director (1/2)	60

Study Review Committees

DATES	COMMITTEE	ROLE	INSTITUTION
2006-2011 annual	Annual Research Review	Biostatistical reviewer	Juvenile Diabetes Research Foundation
2011-2012 twice	HSR&D Scientific Merit Review Board	Biostatistical reviewer, ad hoc	Dep't of Veteran Affairs
2012	Study Section on Multiple Sclerosis	Biostatistical reviewer	Canadian Institutes of Health Research
2001-2012 5 times	NSD-K: Clinical Trials in Neurology	Biostatical reviewer, ad hoc	National Institute of Neurological Disorders and Stroke (NINDS)
2004-2016 ~15 times	Special Emphasis Panels	Biostatical reviewer	National Institute of Diabetes and Digestive Diseases (NIDDK)
2012-2015	Neuro-Fibromatosis Consortium	Biostatical reviewer	University of Alabama at Birmingham
2015	Study Section for Data Analysis Proposals	Biostatical reviewer	The Environmental Determinants of Diabetes in the Young (TEDDY), NIDDK

External Data Safety Monitoring Committees

DATES	COMMITTEE	ROLE	INSTITUTION
2007-11	Randomized Crossover in non-dystrophic myotonia	DSMB	sponsored by NINDS, PI: R. Barohn, University of Kansas
2009-11	DIAPREV-IT: A double-blind, randomized investigator-initiated study to determine the safety and the effect of Diamyd® on the progression to type 1 diabetes in children with multiple islet cell autoantibodies	DSMB	Lund University, Sweden
2011-2013	Phase II Trial of Sildenafil in Newborns with Persistent Pulmonary Hyptertension	DSMB	sponsored by NHLBI, PI: John Kinsella, U. Colorado (U01 HL102235-01A1).
2012-current	Duchenne Muscular Dystrophy; A Double-blind Randomized Trial to Find Optimum Regimen	DSMB	sponsored by NINDS, PI: Robert Griggs, University of Rochester
2015-current	Diabetes Prevention Program Outcomes Study (DPPOS)	DSMB	sponsored by NIDDK, PI: Marinella Temprosa, George Washington University; Study Chair, David Nathan, Harvard Medical School
2015-current	Chlorthalidone in Chronic Kidney Disease (CLICK)	DSMB	sponsored by NHLBI, PI: Rajiv Agarwal, Indiana University

EDITORIAL BOARDS:

DATES	JOURNAL	ROLE
2010-2014	Endoscopy	Frequent statistical review (150+ reviews)
2011-2014	The Lancet	Frequent statistical review (50 reviews)
2013-2017	The Lancet Respiratory Medicine	Frequent statistical review (25+ reviews)
2014-2017	Health Services Outcomes and Research Methodology	Associate Editor

https://scholar.google.com/citations?user=jwW_WhMAAAAJ&hl=en

Peer-reviewed publications (226 in total)

1. Esdaile J.M., **MacKenzie T.,** Barre P., Danoff D., Osterland C.K., Somervill P., Quintal H., Kashgarian M., Suissa S. (1992). Can experienced clinicians predict the outcome of lupus nephritis?. *Lupus,* 1(4), 205-214. PMID: 1301984

2. Goulet J-R, **MacKenzie T.,** Levinton C., Hayslett J.P., Ciampi A., Esdaile J.M. (1993). The longterm prognosis of lupus nephritis: The impact of disease activity. *J Rheumatology,* **20(1)**, 59-65. PMID: 8441167

3. Esdaile J.M., Joseph L., **MacKenzie T.,** Kashgarian M., Hayslett J.P. (1993). The pathogenesis and prognosis of lupus nephritis: Information from repeat renal biopsy. *Seminars Arthritis Rheumatology,* **23(2)**: 135-148. PMID: 8266110

4. Esdaile J.M., Joseph L., **MacKenzie T.,** Kashgarian M., Hayslett J.P. (1994). The benefit of early treatment with immunosuppressive agents in lupus nephritis. *J Rheumatology,* 21(11): 2046-51. PMID: 7869308

5. Denardo E.V., Hoffman A.J., **MacKenzie T.,** Pulleyblank W.R. (1994). A nonlinear allocation problem. *IBM Journal of Research and Development,* **38(3):** 301-306.

6. Esdaile J.M., Abrahamowicz M., **MacKenzie T.,** Hayslett J.P., Kashgarian M. (1994). The time-dependence of long-term prediction in lupus nephritis. *Arthritis Rheumatism,* **37(3):** 359-368. PMID: 8129791

7. Fraenkel L., **MacKenzie T.,** Kashgarian M., Hayslett J., Esdaile J.M. (1994). Response to therapy as a predictor of long term outcome in lupus nephritis. *J Rheumatology,* **21(11):** 2052-2057. PMID: 7869309

8. Esdaile J.M., Abrahamowicz M., Joseph L., **MacKenzie T.,** Li Y., Danoff. (1996). Laboratory tests as predictors of disease exacerbations in systemic lupus erythematosus. Why some tests fail. *Arthritis Rheumatism,* **39(3):**370-8. PMID: 8607885

9. Abrahamowicz M, **Mackenzie T**, and Esdaile J.M. (1996). Time-Dependent hazard ratio: modeling and hypothesis testing with application in lupus nephritis. *Journal of the American Statistical Association*, **91(436):** 1432-1439.

10. **MacKenzie T.** and Abrahamowicz M. (1996). B-Splines Without Divided Differences. *Student*, **1,** 223-230.

11. Garg, SK, Anderson JH, Perry SV, **Mackenzie T**, Keith P, Jennings MK, Hansen MM, Chase HP. (1999). Long-term efficacy of humalog in subjects with Type 1 diabetes mellitus. *Diabet Med,* 16(5):384-7. PMID: 10342337

12. Lalonde L, Clark AE, Joseph L, **MacKenzie T**, Grover SA and the Canadian Collaborative Cardiac Assessment Group. (1999). Comparing the psychometric properties of preference-based and nonpreference-based health-related quality of life in coronary heart disease. *Quality of Life Research Journal,* **8(5)**: 399-409. PMID: 10474281

13. Quantin C, Abrahamowicz M, Moreau T, Bartlett G, **MacKenzie T**, Tazi MA, Lalonde L and Faivre J. (1999). Variation Over Time of the Effects of Prognostic Factors in a Population-based Study of Colon Cancer: Comparison of Statistical Models. *American Journal of Epidemiology*, 150(11):1188-200. PMID: 10588079

14. Wathen, J., Roback M., **MacKenzie, T.** and Bothner, J. (2000). Does Midazolam Alter the Clinical Effects of Intravenous Ketamine Sedation in Children? A Double Blind, Randomized, Controlled, Emergency Department Trial. *Annals of Emergency Medicine*, Dec;36(6):579-88. PMID: 11097698

15. Garg, SK, Anderson, JH, Gerard, LA, **MacKenzie, TA**, Gottlieb, PA, Jennings, MK and Chase, HP. (2000). Impact of Insulin Lispro on HbA1c values in insulin pump users. *Diabetes, Obesity and Metabolism*, **2(5)**; 307-311. PMID: 11225746

16. Kempe, A., Dempsey, C., Whitefield, J., Bothner, J., **MacKenzie, T.** and Poole, S. (2000). Appropriateness of Urgent Referrals by Nurses at a Hospital-Based Pediatric Call Center. *Archives of Pediatric Adolescent Medicine*, 154: 355-360. PMID: 10768672

17. Ingram, J.D., Connell, J., Hay, T.C., Strain, J.D., and **MacKenzie, T**. (2000). Oblique radiographs of the chest in nonaccidental trauma. *Emergency Radiology*, 7(1):42-46.

18. Chase, H.P., Lockspeier, T., Peery, B., Shepherd, M., **MacKenzie, T.**, Anderson, J. and Garg, S.K. (2001). The Impact of the Diabetes Control and Complications Trial and Humalog Insulin on Glycohemoglobin Levels and Severe Hypoglycemia in Type 1 Diabetes. *Diabetes Care*, 24(3):430-34. PMID: 11289463

19. Elzi, D.J., Bjornse, A.J., **MacKenzie, T.**, Wyman, T.H., Silliman, C.C. (2001). Ionomycin causes activation of p38 and p42/44 mitogen activated protein kinases in human neutrophils. *AJP-Cell Physiology,* Jul;281(1):C350-60. PMID: 11401859

20. Redondo MJ, Yu L, Hawa M, **Mackenzie T**, Pyke DA, Eisenbarth GS, Leslie RD. (2001). Heterogeneity of type 1 diabetes: analysis of twins in the United Kingdom and United States. *Diabetologia*, **44(3)**:354-62. PMID: 11317668

21. La Londe, L., Clarke, AE, Joseph, L., **MacKenzie, T**. and Grover, S. (2001). Health-related quality of life with coronary heart disease prevention and treatment. *Journal of Clinical Epidemiology,* **54(10)**:1011-8. PMID: 11576812

22. Miga, D., Sokol, R., **MacKenzie, T.**, Narkewicz, M.R., Smith, D., Karrer, F.M., and Lilly, J.R., (2001). Survival After First Esophageal Variceal Hemorrhage in Patients with Biliary Atresia. *Journal of Pediatrics,* **139(2)**: 291-6. PMID: 11487759

23. Kramer, R.E., Sokol, R.J., Yerushalmi, B., Liu, E., **MacKenzie, T.**, Hoffenberg, E.J., Narkewicz, M.R. (2001). Large Volume Paracentesis in the Management of Ascites in Children. *Journal of Pediatric Gastroenterology and Nutrition,* **33(3)**:245-9. PMID: 11593116

24. Chase, H.P., Kim, L.M., Owen, S.L., **MacKenzie, T.**, Klingensmith, G.J., Murtfeldt, R., and Garg, S.K. (2001). Continuous Subcutaneous Glucose Monitoring in Children With Type 1 Diabetes. *Pediatrics,* 107(2): 222-226. PMID: 11158450

25. Shea, C., Westfall, K., **MacKenzie, T**., Bateman, B. (2001). Comparison of Measured Astigmatic Retinoscopies with Different Lid Specula. *Journal of AAPOS (American Association for Pediatric Ophthalmology and Strabismus),* **5(6)**:357-60. PMID: 11753255

26. Noorhasan Gardner, S.C., Grunwald, G.K., Rumsfeld, J.S., **Mackenzie, T.**, Gao, D., Perlin, J.B., McDonald, G., Shroyer, A.L. (2001). Risk factors for intermediate-term survival after coronary artery bypass grafting. *Annals of Thoracic Surgery, **72(6)**:2033-7.* PMID: 11789789

27. Kempe, A., Luberti, A., Hertz, A., Sherman, H., Amin, A, Dempsey, C., Chandramouli, U., **MacKenzie, T.** and Hegarty TW. (2001). The Delivery of Pediatric After-Hours Care by Call Centers—A Multicenter Study of Parental Perceptions and Compliance. *Pediatrics,* **108(6):E**111-116. PMID: 11731638

28. Chase, P., Sahib, S., **MacKenzie, T.**, Hansen, T., Garg, S. (2002). Post-prandial glucose excursions following four methods of bolus insulin administration in subjects with Type 1 diabetes. *Diabetic Medicine,* 19(4):317-21. PMID: 11943004

29. Gieseker, K., **MacKenzie, T.**, Roe, M. and Todd, J. (2002). Comparison of Two Rapid *Streptococcus pyogenes* Diagnostic Tests with a Rigorous Culture Standard. *Pediatr Infect Dis J,* **21(10)**:922-927. PMID: 12394813

30. **MacKenzie, T.**, and Abrahamowicz, M. (2002). Marginal and hazard ratio specific random data generation: applications to semi-parametric bootstrapping. *Statistics and Computing,* **12** (3): 245-252.

31. Mitchell, M.B., Campbell, D.N., Bishop, D.A., **Mackenzie, T.**, and Clarke, D.R. (2002). Surgical options and results of repeat aortic root replacement for failed aortic allografts placed in childhood. *J Thorac Cardiovasc Surg*, 124(3):459-70. PMID: 12202861

32. Rewers, A., Chase, H.P., **MacKenzie, T.**, Walravens, P., Roback, M., Rewers, M., Hamman, R.F., and Klingensmith, G. (2002). Predictors of acute complications in children with type 1 diabetes. *JAMA,* 287(19): 2511-8. PMID: 12020331

33. Gao, D., Grunwald, G.K., Rumsfeld, J.S., **Mackenzie, T.**, and Shroyer, A.L. (2003). Effects of Pre-operative Risk Factors Change During the Seven Months Following Coronary Artery Bypass Graft Surgery. *Annals of Thoracic Surgery,* **75(1)**:74-81.

34. Maselli, JH, Sontag, MK, Norris, JM, **MacKenzie, T**, Wagener, JS, and Accurso, FJ. (2003). Risk factors for initial acquisition of Pseudomonas aeruginosa in children with cystic fibrosis identified by newborn screening. *Pediatric Pulmonology,* **35(4):**257-62.

35. Gieseker, K., Roe, M., **MacKenzie**, T., Todd, J. (2003). Evaluating the American Academy of Pediatrics Diagnostic Standard for Streptococcus pyogenes Pharyngitis: Backup Culture Versus Repeat Rapid Antigen Testing. *Pediatrics,* **111(6)**: e666-e670. PMID: 12777583

36. Hoffenberg, E.J., **MacKenzie**, T., Barriga, K.J., Eisenbarth, G.S., Bao, F., Erlich, H., Haas, J.E., Sokol, R.J., Taki, I., Norris, J., and Rewers, M. (2003). A Prospective Study of the Incidence of Childhood Celiac Disease. *Journal of Pediatrics,* **143(3)**:308-314. PMID: 14517510

37. A Kempe, A Luberti, S Belman, A Hertz , H Sherman , D Amin , C Dempsey, U Chandramouli, **and MacKenzie, T.** (2003). Outcomes Associated with Pediatric After-Hours Care by Call Centers—A Multicenter Study. *Ambulatory Pediatrics,* **3(4)**:211-7. PMID: 12882599

38. Mitchell MB, Campbell DN, Boucek MM, Sondheimer HM, Chan KC, Ivy DD, Pietra B, **and Mackenzie T**. (2003). Mechanical limitation of pulmonary blood flow facilitates transplantation in older infants with hypoplastic left heart syndrome. *European Journal of Cardiothoracic Surgery,* **23**:735-42. PMID: 12754026

39. Garg SK, Frias JP, Anil S, Gottlieb PA, **MacKenzie T**, Jackson WE. (2003). Insulin lispro therapy in pregnancies complicated by type 1 diabetes: glycemic control and maternal and fetal outcomes. *Endocrinology Practice,* **9(3):**187-93. PMID: 12917059

40. Burch, J.M., Sokol, R.J., Narkewicz, M.R., Reichlin, M., Frank, M.B., **MacKenzie, T.**, and Lee, L.A. (2003). Autoantibodies in mothers of children with neonatal liver disease. *Journal of Pediatric Gastroenterology and Nutrition*, **37(3)**:262-7. PMID: 12960647

41. Snell-Bergeron, J., Hokanson, J.E., Jensen, L., **MacKenzie, T.,** Kinney, G., Dabelea, D., Erlich, J., Eckel, R.H., Garg, S. and Rewers, M. (2003). Progression of Coronary Artery Calcification in Type I Diabetes: The Importance of Glycemic Control. *Diabetes Care,* **26(10)**:2923-2928. PMID: 14514603

42. Hokanson, J. , **MacKenzie, T.,** Kinney, G., Snell-Bergeon, J.K, Dabelea, D., Ehrlich, J., Eckel, R.H., and Rewers, M. (2004). Evaluating changes in coronary artery calcium: An analytic method that accounts for inter-scan variability. *American Journal of Roentgenology,* **182(5)**:1327-32. PMID: 15100140

43. Chase, H.P., **MacKenzie, T.**, Burdick, J., Fiallo-Scharer, R., Walravens, P., Klingensmith, G. and Rewers, M. (2004). Redefining the Clinical Remission Period in Children with Type 1 Diabetes. *Pediatric Diabetes,* **5(1)**:16-9. PMID: 15043685

44. Kobak, G.E, **MacKenzie, T**., Sokol, R.J., and Narkewicz, M.R. (2004). Interferon Treatment for Chronic Hepatitis B: Enhanced Response in Children Less Than 5 Years Old. *Journal of Pediatrics*, **145(3)**:340-5.

45. Wathen, J., **MacKenzie, T.** and Bothner, J. (2004). Utility of Serum Electrolytes in the Emergency Department Management of Pediatric Dehydration. *Pediatrics,* **114(5)**: 1227-34.

46. **MacKenzie, T.** and Abrahamowicz, M. (2005). Using Categorical Markers as Auxiliary Variables in Log-rank Tests and Hazard Ratio Estimation. *Canadian Journal of Statistics,* **33(2):** 201-219.

47. Duong, M., **MacKenzie, T.** and Malenka, D. (2005). N-acetylcysteine Prophylaxis Significantly Reduces the Risk of Radiocontrast-Induced Nephropathy: Comprehensive Meta-Analysis. *Catheterization and Cardiovascular Intervention*, 64(4):471-489. PMID: 15789388

48. Carney PA, Goodrich ME, Weiss JE, **MacKenzie T**, Weiss JE, Poplack SP, Wells WA, Titus-Ernstoff L. (2005). Utilization of screening mammography in New Hampshire: a population-based assessment. *Cancer,* 104(8): 1726-1732.

49. Liu, E., **MacKenzie, T**., Dobyns, E.L., Parikh, C.R., Karrer, F.M., Narkewicz, M.R. and Sokol, R. (2006). Characterization of acute liver failure and development of a continuous risk of death staging system in children. *Journal of Hepatology,* **44(1):**134-41.

50. Gao D, Grunwald GK, Rumsfeld JS, Schooley L, **MacKenzie T**, Shroyer ALW. (2006). Time-varying risk factors for long-term mortality after coronary artery bypass graft surgery. *Ann Thorac Surg,* **81(3)**:793-9. PMID: 16488675

51. Wallace AE, **MacKenzie TA**, Weeks WB. (2006). Women's Primary Care Providers and Breast Cancer Screening: Who's following the guidelines? *American Journal of Obstetrics and Gynecolog,* **194(3)**:744-8. PMID: 16522407

52. Wasson, JH, Johnson, DJ, Benjamin, R., Phillips, J. **and MacKenzie**, **TA.** (2006). Patients Report Positive Impact of Collaborative Care. *Journal of Ambulatory Care Management*, **29(3)**:199-206. PMID: 16788352

53. Gardner, T., Olenec, G., Chertoff, J.D., **MacKenzie, T.**, and Robertson, D. (2006). Hemoconcentration and Pancreatic Necrosis: Further Defining the Relationship. *Pancreas,* **33(2):169-73.** PMID: 16868483

54. Brown, JB, Cochran, RP, Dacey, LJ, Ross, CS, Kunzelman, KS, Dunton, RF, Braxton, JH, Charlesworth, DC, Clough, RA, Helm, RE, Leavitt, BJ, **Mackenzie, T**, and O'Connor, GT, Northern New England Cardiovascular Disease Study Group. (2006). Perioperative Increases In Serum Creatinine Are Predictive Of Increased 90-Day Mortality Following CABG Surgery. *Circulation Surgical Supplement,* **114**:1409-13. PMID: 16820609

55. **MacKenzie, T**., Brooks, B., and O'Connor, G. (2006). Beverage intake, diabetes and glucose control of adults in America. *Annals of Epidemiology,* 16(9):688-91. PMID: 16458538

56. Carney, P., Steiner, E., Goodrich, M., Dietrich, A., Kasales, C., Weiss, J. **and MacKenzie, T**. (2006). Discovery of Breast Cancers that Occur Within One Year of a Normal Screening Mammogram: How Are They Found? *Annals of Family Medicine,* Nov-Dec;4(6):512-8. PMID: 17148629

57. Mark G Roback, Joe E Wathen, **Todd MacKenzie**, and Lalit Bajaj. (2006). A randomized, controlled trial of i.v. versus i.m. ketamine for sedation of pediatric patients receiving emergency department orthopedic procedures. *Annals of Emergency Medicine,* 48(5): 605-12. PMID: 17052563

58. Tracy Onega, John Baron and **Todd MacKenzie. (2006).** Cancer After Total Joint Arthroplasty: A Meta-Analysis. *Cancer Epidemiology, Biomarkers and Prevention,* 15(8):1532-7. PMID: 16896045

59. Abrahamowicz, M. and **MacKenzie, T.** (2007). Joint estimation of time-dependent and non-linear effects of continuous covariates on survival. *Statistics in Medicine,* **26(2)**:392-408. PMID: 16479552

60. Michael H. Duong, **Todd A. Mackenzie**, Robert M. Zwolak, Aaron V. Kaplan, Bruce J. Friedman, John E. Jayne, Nathaniel W. Niles, Bruce D. Hettleman, John F. Robb, and Craig A. Thompson. (2007). Correlation of Invasive Doppler Flow Wire with Renal Duplex Ultrasonography in the Evaluation of Renal Artery Stenosis: The Renal

Artery Stenosis Invasive Doppler (RAIDER) Study. *Journal of Vascular Surgery,* Feb; 45(2): 284-8. PMID: 17264004

61. Altschuler, J., Casella, S., **MacKenzie, T.** and Curtis, K. (2007). The Effect of Cinnamon on HbA1c Among Adolescents with Type 1 Diabetes. *Diabetes Care,* **30(4)**:813-6. PMID: 17392542

62. Weeks, B. , Wallace, A., **MacKenzie, T.** (2007). Gender differences in anesthesiologists' annual incomes. *Anesthesiology,* 106(4):806-811. PMID: 17413919

63. Wasson, J., **MacKenzie, T.**, and Hall, M. (2007). Patients use an internet technology to report when things go wrong. *Quality and Safety in Health Care,* **16**:213-215. PMID: 17545349

64. Jeremiah Stitham, Eric J. Arehart, Scott R. Gleim, Karen L. Douville**, Todd A. MacKenzie** and John Hwa. (2007). Arginine (CGC) codon targeting in the human prostacyclin receptor gene (PTGIR) and G-protein coupled receptors (GPCR). *Gene,* **396(1):**180-7. PMID: 17481829

65. **MacKenzie, T.**, Ernstoff, L., Geller, B., Vacek, P., Weiss, J.E, Goodrich, M.E. and Carney, P.A. (2007). Factors Associated With Risk of Incident Ductal Carcinoma in Situ in Women Undergoing Screening Mammography. *Cancer Causes and Control,* Nov;18(9):939-45.

66. Brown, JB, Cochran, RP, Leavitt, BJ, Dacey, LJ, Ross, CS, **Mackenzie, T**,, Kunzelman, KS, Kramer, RS., Hernandez, F., Helm, RE, Westbrook, BM, Dunton, RF, Malenka, DJ, and O'Connor, GT. (2007). Multivariable Prediction of Renal Insufficiency Developing After Cardiac Surgery. *Circulation Surgical Supplement,* **116** (11 Suppl):I139-43. PMID: 17846294

67. **MacKenzie, T.**, Leary, L. and Brooks, W.B. (2007). The Effect of an Extract of Green Tea on Glucose Control in Adults With Type 2 Diabetes: Blinded Randomized Study. *Metabolism,* 56(10):1340-1344.

68. Buckey, J., Alvarenga, D., **MacKenzie, T.** (2007). Chlorpheniramine and Ephedrine in Combination for Motion Sickness. *Journal of Vestibular Research,* **17**(5-6):301-11. PMID: 18626140

69. Prairie, B., George, K., Lauria, M., **MacKenzie, T.** Kapp, N., and Baker, E. (2007). Mifepristone versus laminaria: a randomized controlled trial of cervical ripening in midtrimester termination. *Contraception,* 76(5):383-8. PMID: 17963864

70. **MacKenzie, T**, Comi, R., Sluss, P., Kesari, R., Manwar, S., Kim., J., Larson, R. and Baron, J. (2007). Metabolic and hormonal effects of caffeine: randomized, double-blind, placebo-controlled crossover trial. *Metabolism,* 56(12): 1694-1698. PMID: 17998023

71. Seigel, C., Levy, LC, **MacKenzie, T**, and Sands, B. (2008). Patient Perceptions of the Risks and Benefits of Infliximab for the Treatment of Inflammatory Bowel Disease. *Inflammatory Bowel Diseases,* **14(1)**:1-6. PMID: 17924559

72. Brown JR, DeVries JT, Robb JF, Hearne MJ, Ver Lee PM, Kellett MA, Watkins MW, Ryan TJ, Silver MT, Piper WD, Ross CS, **MacKenzie TA**, O'Connor GT, Malenka DJ. (2008). Serious Renal Dysfunction After Percutaneous Coronary Intervention Can Be Predicted. *Am Heart J,* 155(2):260-266. PMID: 18215595

73. Stern, J., Goldman, M., Hataska H. **MacKenzie, T**, Racowsky, C., and Surrey, E. (2009). Optimizing the number of blastocyst stage embryos to transfer on day 5 or 6 in women 38 years of age and older: A SART database study. *Fertility and Sterility,* **91(1)**:157-66. PMID: 18222441

74. Stern, J., Goldman, M., Hataska H. **MacKenzie, T**. Racowsky, C., and Surrey, E. (2009). Optimizing the number of cleavage stage embryos to transfer on day 3 in women 38 years of age and older: A SART database study. *Fertility and Sterility,* **91(3)**:767-76. PMID: 18321489

75. Wasson JH, Johnson DJ, **Mackenzie T**. (2008). The Impact of Primary Care patients' Pain and Emotional Problems on Their Confidence With Self-Management. *J Ambul Care Manage,* **31(2)**:120-7. PMID: 18360173

76. Likosky DS, Dacey LJ, Baribeau YR, Leavitt BJ, Clough R, Cochran RP, Quinn R, Sisto DA, Charlesworth DC, Malenka DJ, **MacKenzie TA**, Olmstead EM, Ross CS, O'Connor GT. (2008). Long-term Survival of the Very Elderly Undergoing Coronary Artery Bypass Grafting. *Annals of Thoracic Surgery,* **85(4)**: 1233-7.

77. Haessler, S, **MacKenzie, T.** and Kirkland, K. (2008). Association of Mortality and Resistance to Methicillin in Patients Infected with Staphylococcus Aureus. *Journal of Hospital Infection,* May; **69(1)**:39-45.

78. Dorosko, S., **MacKenzie, T.**, Connor, R. (2008). Fecal calprotectin concentrations are higher in exclusively breastfed infants compared to those who are mixed-fed. *Breastfeeding Medicine,* Jun;**3(2)**:117-9. PMID: 18564000

79. Arehart, E., Stitham, J., Douville, K, **MacKenzie, T**., Fetalvero KM, Gleim S, Kasza Z, Rao Y, Martel L, Segel S, Robb J, Kaplan A, Simons M, Powell RJ, Moore JH, Martin KA, and Hwa J. (2008). Acceleration of cardiovascular disease by a dysfunctional prostacyclin receptor mutation: potential implications for cyclooxygenase-2 inhibition. *Circulation Research,* Apr 25;**102(8)**:986-93. PMID: 18323528

80. Schalock PC, Zug KA, Carter JC, Dhar D, **Mackenzie T**. (2008). Efficacy and patient perception of grenz ray therapy in the treatment of dermatoses refractory to other medical therapy. *Dermatitis,* **19(2)**:90-4. PMID: 18413110

81. Brown JR, Cochran RP, **MacKenzie TA**, Furnary AP, Kunzelman KS, Ross CS, Langner CW, Charlesworth DC, Leavitt BJ, Dacey LJ, Helm RE, Braxton JH, Clough RA, Dunton RF, O'Connor GT; Northern New England Cardiovascular Disease Study Group. (2008). Long-term survival after cardiac surgery is predicted by estimated glomerular filtration rate. *Ann Thorac Surg,* **86(1)**:4-11. PMID: 18573389

82. Samer Singh, Robert Tokhunts, Valerie Baubet, John A. Goetz, Zhen Jane Huang, Todd A. **MacKenzie**, Nadia Dahmane and David J. Robbins. (2009). Sonic Hedgehog Mutations Identified in Holoprosencephaly Patients Can Act in a Dominant Negative Manner. *Human Genetics,* **125**:95-103. PMID: 19057928

83. **MacKenzie, T**., Malenka, D., Olmstead, E., Piper, W., Langner, C., Ross, C. and O'Connor, GT. (2009). Prediction of Survival after Coronary Revascularization: Modeling Short, Mid-, and Long-Term Survival. *Annals of Thoracic Surgery,* **87(2)**: 463-72. PMID: 19161761

84. Zug KA, Aaron DM and **MacKenzie, T**. (2009). Baseline Quality of Life as Measured By Skindex-16 + 5 in Patients Presenting to a Referral Center for Patch Testing. *Dermatitis,* **20(1):** 21-8. PMID: 19321116

85. McLellan RK, Comi RJ, **MacKenzie T,** Tliton PA and Dietrich AJ. (2009). The Usefulness and Cost of a Shorter Duration of Fasting in Workplace Screening for Glucose Intolerance and Metabolic Syndrome. *Diabetes Research and Clinical Practice,* 84(1):e6-8. PMID: 19187998

86. Yasaitis L, Fisher E, **MacKenzie T** and Wasson J. (2009). Healthcare intensity is associated with lower ratings of healthcare quality by younger adults. *J. Ambulatory Care Management,* **32(3)**: 226-31. PMID: 19542812

87. McLellan RK., **MacKenzie T**, Tilton, P. Dietrich AJ, Comi RJ and Feng YY. (2009). Impact of Workplace Sociocultural Attributes on Participation in Health Assessments. *J Occup. Environ Medicine,* **51(7)**: 797-803. PMID: 19528837

88. Elijah W. Stommel, Jeffrey A. Cohen, Camilo E. Fadul, Christopher H. Cogbill, David J. Graber, Linda Kingman, **Todd Mackenzie**, Jacqueline Y. Channon, Brent T. Harris. (2009). Efficacy of Thalidomide for the Treatment of Amyotrophic Lateral Sclerosis: A Phase II Open Label Clinical Trial. *Amyotrophic Lateral Sclerosis,* **10(5-6):**393-404. PMID: 19922130

89. Robertson DJ, Jacobs DP, Mackenzie TA, Oringer JA, Rothstein RI. (2009) Clinical trial: a randomized, study comparing meperidine (pethidine) and fentanyl in adult gastrointestinal endoscopy. Aliment Pharmacol Ther. 29(8):817-23.

90. Onega, T., **MacKenzie, T.,** Weiss, J., Goodrich M, and Titus-Ernstoff, L. (2010). Screening Mammography Intervals Among Post-Menopausal Hormone Therapy Users and Non-Users. *Cancer Causes & Control,* **21(1):**147-52. PMID: 19844798

91. Morden NE, Berke EM, Welsh DE, MaCarthy JF, **MacKenzie TA**, Kilbourne AM. (2010). Quality of Care for Cardiometabolic Disease: Associations with Mental Disorder and Rurality. *Medical Care,* **48(1)**:72-8. PMID: 19927015

92. Von Reyn, F, Mtei L, Arbeit RD, Waddell R, Cole B, **Mackenzie T**, Matee M, Bakari M, Tvaroha S, Adams LV, Horsburgh CR, Pallangyo K. (2010). Prevention of tuberculosis in BCG-primed, HIV-infected adults boosted with an inactivated whole cell mycobacterial vaccine. *AIDS,* **24(5)**:675-85. PMID: 20118767

93. Gunturu, K., Meehan, K., **MacKenzie, T**. Fisher, J. and Ernstoff, M. (2010). A Cytokine Working Group Study of Lymphodepleting Chemotherapy, IL-2 and GM-CSF in Metastatic Melanoma: Clinical Outcomes and Peripheral Blood Cell Recovery. *Journal of Clinical Oncology,* **28(7)**:1196-202. PMID: 20124177

94. Sutherland LA, **MacKenzie T,** Purvis LA, Dalton M. (2010). Prevalence of food and beverage brands in movies: 1996-2005. *Pediatrics,* **125**(3):468-74.

95. Wallace AE, Lee R, **MacKenzie TA**, West AN, Wright SM, Booth BM, Hawthorne K, Weeks WB. (2010). Longitudinal Analysis of Rural and Urban Veterans' Health-Related Quality of Life. *Journal of Rural Health,* **26(2)**: 156-63. PMID: 20447002

96. Wallace AE. **MacKenzie TA**, Wright SM and Weeks WB. (2010). A cross-sectional, multi-year examination or rural and urban Veterans Administration users:2002-2006. *Military Medicine,* **175(4):**252-8. PMID: 20446500

97. Nelson WA, Rosenberg MC, **MacKenzie T**, Weeks W. (2010). The Presence of Ethics Programs in Critical Access Hospitals. *Health Care Ethics Committee Forum,* 22(4):267-74. PMID: 20714785

98. Lahey T, Sheth S, Matee M, Arbeit R, Horsburgh R, Mtei L, **MacKenzie T**, Bakari M, Vuola J, Pallangyo K, von Reyn F. (2010). Interferon-Gamma Responses to Mycobacterial Antigens Protect Against Subsequent HIV-associated Tuberculosis. *Journal of Infectious Diseases,* **202(8):**1265-72. PMID: 20812851

99. Maro I; Lahey T; **MacKenzie T**; Mtei L; Bakari M; Matee M; Pallangyo K,; von Reyn C. (2010). Low and Falling Body Mass Index Predict HIV-associated Tuberculosis: A Prospective Study in Tanzania. *International Journal of Tuberculosis and Lung Disease,* **14(11)**:1447-53. PMID: 20937186

100. Adachi-Mejia AM, Drake KM, **MacKenzie TA**, Titus-Ernstoff L, Longacre MR, Hendricks KH, Beach, ML, Dalton MA. (2010). Perceived intrinsic barriers to physical activity among rural mothers. *Journal of Women's Health*, 19(12):2197-202. PMID: 20973674

101. Brown JR, **Mackenzie TA,** Dacey LJ, Leavitt BJ, Braxton JH, Westbrook BM, Helm RE, Klemperer JD, Frumiento C, Sardella GL, Ross CS, O'Connor GT; Northern New England Cardiovascular Disease Study Group. (2010). Using biomarkers to improve the preoperative prediction of death in coronary artery bypass graft patients. *J. Extra Corpor Technol,* **42(4)**:293-300. PMID: 21313927

102. **MacKenzie, T**., Wallace, A. and Weeks, W. (2010). Impact of Rural Residence on Survival of Male Veteran Affairs Patients After Age 65. *Journal of Rural Health,* **26:**318-324. PMID: 21029166

103. Wasson JH, Benjamin R, Johnson D, Moore LG and **MacKenzie T.** (2011). Patients use the internet to enter the medical home. *J Ambul Care Manage,* **34(1):**38-46. PMID: 21160351

104. **MacKenzie T**, Michael S. Zens, Assiamira Ferrara, Alan Schned, and Margaret R. Karagas. (2011). Diabetes and Risk of Bladder Cancer: Evidence from a Case-Control Study in New England. *Cancer,* 117(7):1552-6. PMID: 21425156

105. Stitham J, Arehart E, Elderon L, Gleim SR, Douville K, Kasza Z, Fetalvero K, **Mackenzie T**, Robb J, Martin KA, Hwa J. (2011). Comprehensive biochemical analysis of rare prostacyclin receptor variants: Study of association of signaling with coronary artery obstruction. *J Biol Chem,* **286(9)**:7060-9. PMID: 21189259

106. Gardner TB, Coelho-Prabhu N, Gordon SR, Gelrud A, Maple JT, Papachristou GI, Freeman ML, Topazian MD, Attam R, **Mackenzie TA**, Baron TH. (2011). Direct endoscopic necrosectomy for the treatment of walled-off pancreatic necrosis: results from a multicenter U.S. series. *Gastrointest Endosc*, **121(2):**719-26. PMID: 21237454

107. Wheeler M, De Herdt V, Vonck K, Gilbert K, Manem S, **Mackenzie T**, Jobst B, Roberts D, Williamson P, Van Roost D, Boon P, Thadani V. (2011). Efficacy of vagus nerve stimulation for refractory epilepsy among patient subgroups: A re-analysis using the Engel classification. *Seizure,* 20(4):331-5. PMID: 21273097

108. Longacre MR, Primack BA, Owens PM, Gibson L, Beauregard S, **MacKenzie TA**, Dalton MA. (2011). Public directory data sources do not accurately characterize the food environment in two predominantly rural states. *Journal of the American Dietetic Association,* **11(4)**:577-82. PMID: 21443992

109. Whiteside JL, Small TA, **Mackenzie TA**, Grimes CL, Shore LE, Birenbaum D. (2011). Interobserver Reliability of Microscopic Assessment of Saline-Prepared Vaginal Fluid. *J Low Genit Tract Dis,* **15(2)**:120-3. PMID: 21478698

110. Von Reyn CF, Kimambo S, Mtei L, Arbeit RD, Maro I, Bakari M, Matee M, Lahey T, Adams LV, Black W, **Mackenzie T**, Lyimo J, Tvaroha S, Waddell R, Kreiswirth B, Horsburgh CR, Pallangyo K. (2011). Disseminated tuberculosis in HIV infection: ineffective immunity, polyclonal disease and high mortality. *International Journal of Tuberculosis and Lung Disease,* **15(8):**1087-92. PMID: 21740673

111. Lahey T, Mitchell B, Arbeit RD, Sheth S, Matee M, Horsburgh R, **MacKenzie T**, Meti L, Bakari M, Vuola JM, Pallangyo K, von Reyn F. (2011). Polyantigenic Interferon-<gamma> Responses Are Associated with Protection from TB among HIV-infected Adults with Childhood BCG Immunization. *PLoS ONE,* **6(7)**:e22074. PMID: 21799772

112. Warndorf MG, Kurtzman JT, Bartel MJ, Cox M, **Mackenzie T**, Robinson S, Burchard PR, Gordon SR, Gardner TB. (2011). Early Fluid Resuscitation Reduces Morbidity Among Patients With Acute Pancreatitis. *Clinical Gastroenteroly and Hepatology,* **9(8)**:705-9. PMID: 21554987

113. Likosky D, Surgenor SD, Kramer RS, Russo L, Leavitt BJ, Sorensen MJ, Helm RE, Sardella GL, DipErro FV, Baribeau YR, Malenka D, **MacKenzie TA**, Brown JR, Ross CS. (2011). Effect of Prior Cardiac Operations on Survival After CABG Surgery. *Annals of Thoracic Surgery,* **92**:1260-7. PMID: 21958769

114. Meir Preis, Timothy B. Gardner , Stuart R. Gordon , Marc J. Pipas , **Todd A. Mackenzie**, Erin E. Klein , Daniel S. Longnecker , Edward J. Gutmann , Lorenzo F. Sempere. (2011). microRNA-10b Expression Correlates with Response to Neoadjuvant Therapy and Survival in Pancreatic Ductal Adenocarcinoma. *Clinical Cancer Research,* **17(7)**:5812-21. PMID: 21652542

115. Morden N, Liu S, Smith J, **MacKenzie T**, Skinner J and Korc M. (2011). Further Exploration of the Relationship between Insulin Glargine and Incident Cancer: A Retrospective Cohort Study of Older Medicare Patients. *Diabetes Care,* **34(9)**:1965-71. PMID: 21775752

116. Brown JR, Furnary AP, **MacKenzie TA**, Duquette D, Helm RE, Ross CS, Malenka DJ and O'Connor GT. (2011). Does Tight Glucose Control Prevent Myocardial Injury and Inflammation?. *J. Extra Corpor Technol,* **43**:144-152. PMID: 22164453

117. Chaychi L, **MacKenzie T**, Bilotta D, Lynch M, Cohen J and Comi R. (2011). Association of serum vitamin D level with chronic polyneuropathy. *Medical Practice and Review,* **2(1):**11-15.

118. Brown JR, McCullogh P, Splaine M, Davies L, ross C, Dauerman H, Boss R, Goldberg D, Fedele F, Kellett M, Phillips W, Ver Lee P, Nelson E, **MacKenzie T**, O'Connor G, Sarnak M, Malenka D. (2011). How Do Centers Begin The Process To Prevent CI-AKI: A Report from a New Regional Collaborative. *BMJ Quality & Safety,* 21(1):54-62. PMID: 21890755

119. Beisswenger P, Howell S, **MacKenzie T**, Corstjens H, Muizzuddin N and Matsui MS. (2011). Two fluorescent wavelengths 440ex/520em and 370ex/440em reflect advanced glycation and oxidation end-products in non-diabetic human skin. *Diabetes Technology & Therapeutics,* **14(3):** 285-92.

120. West A and **MacKenzie T.** (2011). Time Trends in Expenditures for Rural Veterans' Healthcare. *The Journal of Rural Social Sciences,* **26(3):**181-200.

121. Skatrud-Mickelson, Monica, Adachi-Mejia AM, **MacKenzie, Todd** and Sutherland LA. (2012). Giving the wrong impression: Food and beverage brand impressions delivered to youth through popular movies. *Journal of Public Health,* **34(2)**:245-52. PMID: 22076600

122. Brown JR, Kramer R, **MacKenzie TA**, Coca SG, Sint K, and Parikh CR. (2012). Determinants of Acute Kidney Injury Duration After Cardiac Surgery: An Externally Validated Tool. *Annals of Thoracic Surgery,* **93(2):**570-6. PMID: 22206952

123. **MacKenzie T,** Brown JR, Likosky DS, Grunkemeier G, Wu YX. (2012). Review of Case-Mix Adjusted Survival Curves. *Annals of Thoracic Surgery,* **93(5):**1416-25. PMID: 22541174

124. Kaser D, Kinsler E, **MacKenzie T**, Hanissian P, Strohbehn K, and Whiteside J. (2012). Anatomic and functional outcomes of sacrocolpopexy with or without posterior colporrhaphy. *International Urogynecology Journal,* 23(9):1215-20. PMID: 22426873

125. Morden NE, Lai Z, Goodrich DE, **MacKenzie T**, McCarthy JF, Austin K, Welsh D, Bartels S and Kilbourne A. (2012). Eight Year Trends of Cardiometabolic Morbidity and Mortality in Patients with Schizophrenia. *General Hospital Psychiatry, 3***4(4)**:368-79. PMID: 22516216

126. Longacre MR, Drake KM, **MacKenzie TA**, Gibson L, Owens PM, Titus-Ernstoff L, Beach ML and Dalton MA. (2012). Association between Fast Food Environments and Family Fast Food Intake in Non-Metropolitan Areas. *American Journal of Preventive Medicine,* **42(6)**:579-87.

127. JM Pipas, BI Zaki, MM McGowan, MJ Tsapakos, GH Ripple, AA Suriawinata, GJ Tsongalis, TA Colacchio, SR Gordon, JE Sutton, A Srivastava, KD Smith, TB Gardner, M Korc, TH Davis, M Preis, SM Tarczewski, TA **MacKenzie**, RJ Barth Jr. (2012). Neoadjuvant Cetuximab, Twice-Weekly Gemcitabine, and Intensity-Modulated Radiotherapy (IMRT) in Patients with Pancreatic Adenocarcinoma. *Annals of Oncology,* **23(11)**:2820-7. PMID: 22571859

128. Drake KM, Beach M, Longacre MR, **MacKenzie T**, Titus-Ernstoff L, Rundle A and Dalton MA. (2012). Influence of sports, physical education, and active travel on adolescent weight gain. *Pediatrics,* Aug;130(2):e296-304.

129. **MacKenzie T.** (2012). Survival Curve Estimation With Dependent Left Truncated Data Using Cox's Model. *International Journal of Biostatistics,* **8(1).** PMID: 23104845

130. Taylor T, Mechella J, Larson R, Kerin K **and MacKenzie T.** (2012). Initiation of Allopurinol at First Medical Contact for Acute Attacks of Gout: A Randomized Clinical Trial. *American Journal of Medicine,* **125(11):**1126-1134. PMID: 23098865

131. Onega T, Weiss J, diFlorio R, **MacKenzie T**, Goodrich M and Poplack S. (2012). Evaluating Surveillance Breast Imaging and Biopsy in Older Breast Cancer Survivors. *International Journal of Breast Cancer,* 2012:347646.

132. LikoskyDS, Goldberg JB, DiScipio AW, Kramer RS, Groom RC, Leavitt BJ, Surgenor SD, Baribeau YR, Charlesworth DC, Helm RW, Frumiento C, d L. Sardella GL, Clough RA, **MacKenzie TA**, Malenka DJ, Olmstead EM, Ross CS. (2012). Variability in Surgeons' Perioperative Practices May Influence the Incidence of Low-Output Failure After Coronary Artery Bypass Grafting Surgery. *Circulation Cardiovascular Quality Outcomes,* **5(5)**:638-644. PMID: 22828825

133. Davis MA, **MacKenzie TA**, Cottingham KL, Gilbert-Diamond D, Punshon T and Karagas MR. (2012). Rice Consumption and Urinary Arsenic Concentrations in US Children. *Environmental Health Perspectives,* **120(10):**1418-24.

134. Davis MA, **Mackenzie TA**, Coulter ID, Whedon JM and Weeks WB. (2012). The United States Chiropractic Workforce: An alternative or complement to primary care? *Chiropractic and Manual Therapies,* **20(1):**35.

135. Titus LJ, Clough-Gorr K, **Mackenzie TA**, Perry A, Spencer SK, Weiss J, Abrahams-Gessel S, and Ernstoff MS. (2013). Recent Skin Self-Examination and Doctor Visits in Relation to Melanoma Risk and Tumor Depth. *British Journal of Dermatology,* 168(3):571-6. PMID: 22897437

136. Lahey T, **MacKenzie T**, Arbeit RD, Bakari M, Mtei L, Matee M, Maro I, Horsburgh CR, Pallangyo K, and von Reyn CF. (2013). Recurrent tuberculosis risk among HIV-infected adults in Tanzania with prior active tuberculosis. *Clinical Infectious Diseases,* **56(1)**:151-8. PMID: 22972862

137. Pohl H, Srivastava A, Bensen SP, Anderson P, Rothstein RI, Gordon SR, Levy LC, Torr A, **MacKenzie TA**, Rosch T and Roberston D. (2013). Incomplete Polyp Resection During Colonoscopy – The Complete Adenoma Resection Study. *Gastroenterology,* **144(1)**:74-80. PMID: 23022496

138. Martin B, Mirza S, Franklin G, Lurie J, **MacKenzie T**, and Deyo R. (2013). Hospital and Surgeon Variation in Complications and Repeat Surgery Following Incident Lumbar Fusion for Common Degenerative diagnoses. *Health Services Research,* **48(1)**:1-25. PMID: 22716168

139. Dulai PS, Pohl H, Levenick JM, Gordon SR, **MacKenzie TA**, Rothstein RI. (2013). Radiofrequency ablation for long- and ultralong-segment Barrett's esophagus: a comparative long-term follow-up study. *Gastrointestinal Endoscopy,* **77(4):**534-41. PMID: 23290719

140. Saunders JE, Jastrzembski BG, Buckey JC, **MacKenzie TA** and Karagas MK. (2013). Hearing Loss and Heavy Metal Toxicity in a Nicaraguan Mining Community: Audiological results and case reports. *Audiology & Neurotology,* **18(2):**101-13. PMID: 23257660

141. Goldberg JB, Desimone JP, Kramer RS, Discipio AW, Russo L, Dacey LJ, Leavitt BJ, Helm RE, Baribeau YR, Sardella G, Clough RA, Surgenor SD, Sorensen MJ, Ross CS, Olmstead EM, **Mackenzie TA,** Malenka DJ, Likosky DS; for the Northern New England Cardiovascular Disease Study Group. (2013). Impact of Preoperative Left Ventricular Ejection Fraction on Long-Term Survival After Aortic Valve Replacement for Aortic Stenosis. *Circulation Cardiovascular Quality Outcomes,* **6(1)**:35-41.

142. Bekelis K, Bakhoum S, Desai A, **MacKenzie T**, Goodney P, and Labropoulos N. (2013). A risk factor-based predictive model of outcomes in carotid endarterectomy: NSQIP 2005-2010. *Stroke,* **44(4):**1085-90.

143. Hardy-Fairbanks A, Lauria MR, **MacKenzie T**, McCarthy M. (2013). Intensity and Unpleasantness of Pain Following Vaginal and Cesarean Delivery: A Prospective Evaluation. *Birth,* **40(2):**125-33. PMID: 24635467

144. Batsis J, Barre LK, **MacKenzie TA**, Pratt SI, Lopez-Jimenez F and Bartels SJ. (2013). Variation in the Prevalence of Sarcopenia and Sarcopenic Obesity in Older Adults Associated with Different Research Definitions: Dual Energy X-Ray Absorptiometry Data from the National Health and Nutrition Examination Survey (NHANES) 1999-2004. *Journal of the American Geriatric Society,* 61(6):974-80. PMID: 23647372

145. Bekelis K, Bakhoum SF, Desai A, **MacKenzie TA** and Roberts DW. (2013). Outcome prediction in intracranial tumor surgery: the National Surgery Quality Improvement Program 2005-2010. *Journal of Neuro-Oncology,* **113(1):**57-64. PMID: 23436132

146. Lahey T, Czechura T, Crabtree S, Arbeit RD, Matee M, Horsburgh6 CR, **MacKenzie T**, Bakar M, Vuola JM,Pallangyo5 K and von Reyn CF. (2013). Greater pre-existing interferon gamma responses to mycobacterial antigens are associated with lower bacillary load during HIV-associated tuberculosis. *The Journal of Infectious Diseases,* **208(10)**:1629-33. PMID: 23908490

147. Bakari M, Wamsele J, **MacKenzie T**, Maro I, Kimario J, Ali S, Dowla S, Hendricks K, Lukmanji Z, Neke N.M., Waddell R, Matee M, Pallangyo K, von Reyn CF. (2013). Nutritional status of HIV-infected women with tuberculosis in Dar es Salaam, Tanzania. *Public Health Action,* **3(3):** 224–229.

148. Maro I, Moshi N, Clavier O, **MacKenzie T**, Kline-Schoder R, Wilbur J, …, von Reyn CF, and Buckey J. (2013). Auditory impairments in HIV-infected individuals in Tanzania. *Ear and Hearing,* **35(3):** 306-17. PMID: 24441742

149. Jones et al, Schanzer A, Zhao Y, **MacKenzie TA**, Nolan BW, Conte MS, Goodney PP, Vascular Study Group of New England. (2013). Growing impact of restenosis on the surgical treatment of peripheral arterial disease. *J. Amer. Heart Assoc.,* 2(6) e000345.

150. Bekelis K, Missios S and **MacKenzie TA.** (2014). Prehospital Helicopter Transport and Survival of Patients With Traumatic Brain Injury. *Annals of Surgery,* **261(3):**579-85. PMID: 24743624

151. Bekelis K, Missios, S, Desai A, **MacKenzie TA**, Fischer A, Labropoulos N, Roberts DW. (2014). Predicting inpatient complications during cerebral aneurysm clipping: the National Inpatient Sample 2005-2009. *Journal of Neurointervention Surgery,* **120(3)**:591-8. PMID: 24032701

152. Walsh T, Onega T and **MacKenzie T.** (2014). Variation in length of stay within and between hospitals. *Journal of Hospital Administration,* **3(4).**

153. **MacKenzie TA**, Tosteson T, Morden NE, Stukel T and O'Malley AJ. (2014). Using Instrumental Variables to Estimate a Cox's Proportional Hazards Regression Subject to Additive Confounding. *Health Services and Outcomes Research Methodology,* **14**:54-68. PMID: 25506259

154. **MacKenzie T**, Gifford A.H., Sabadosa K.A., Quinton H.B., Knapp E.E., Goss C.H. and Marshall B. (2014). Longevity of Patients With Cystic Fibrosis in 2000 to 2010 and Beyond: Survival Analysis of the Cystic Fibrosis Foundation Patient Registry. *Annals of Internal Medicine,* 161(4):233-241. PMID: 25133359

155. Davis MA, Li Z, Gilbert-Diamond D, **Mackenzie TA**, Cottingham KL, Jackson BP, Lee JS, Baker ER, Marsit CJ, Karagas MR. (2014). Infant toenails as a biomarker of in utero arsenic exposure. *J Expo Sci Environ Epidemiol,* **24(5):**467-73. PMID: 24896769

156. Brooke BS, Stone DH, Cronenwettt JL, Nolan B, DeMartino RR, **MacKenzie TA**, Goodman DC and Goodney PP. (2014). Early Primary Care Provider Follow-Up and Readmission After High-Risk Surgery. *JAMA Surgery,* 149(8):821-8. PMID: 25074237

157. Brown JR, Chang CH, Zhou W, **MacKenzie TA**, Malenka DJ, Goodman DC. (2014). Health system characteristics and rates of readmission after acute myocardial infarction in the United States. *J Am Heart Assoc,* **3(3):**e000714. PMID: 24847032

158. Batsis JA, **MacKenzie TA**, Barre LK, Lopez-Jimenez F, and Bartels SJ. (2014). Sarcopenia, sarcopenic obesity and mortality in older adults: results from the National Health and Nutrition Examination Survey III. *Eur J Clin Nutr,* **68(9):**1001-7. PMID: 24961545

159. Allegra M. Condiotte, Douglas J. Robertson, Cory Blodgett, **Todd A. MacKenzie**, and Heiko Pohl. (2014). Running late and adenoma detection – is there an association? *Endoscopy,* **47(3):**232-7. PMID: 25412091

160. Batsis JA, Zbehlik AJ, Barre LK, **Mackenzie** TA and Bartels SJ. (2014). The Impact of Waist Circumference on Function and Physical Activity in Older Adults: Longitudinal Observational Data from the Osteoarthritis Initiative. *Nutrition Journal,* 13:81. PMID: 25106459

161. Whedon J, **Mackenzie T**, Phillips R, and Lurie J. (2014). Risk of Traumatic Injury Associated with Chiropractic Spinal Manipulation in Medicare Part B Beneficiaries Aged 66-99. *Spine,* 40(4):264-70.

162. Likosky D, Al-Attar PM, Malenka D, Furnary AP, Lehr EJ, Paone G, Kommareddi M, Helm R, Jin R, Maynard C, Hanson EC, Olmstead E, **MacKenzie TA**, Ross CS, Zhang M for IMPROVE Network. (2014). Geographic Variability in Potentially Discretionary Red Blood Cell Transfusions After Coronary Artery Bypass Grafting Surgery. *The Journal of Thoracic and Cardiovascular Surgery,* 148(6):3084-9. PMID: 25227699

163. Kim F, Neke NM, Hendricks K, Wamsele W, Lukmanji Z, Waddell R, Maro I, Connor R, **Mackenzie T**, Matee M, Bakari M, Pallangyo K, and von Reyn CF. (2014). Deficiencies of macronutrient intake among HIV-positive breast-feeding women in Dar es Salaam, Tanzania. *Journal of Acquired Immune Deficiency Syndromes,* **67(5):** 569-72.

164. **MacKenzie T**, Schwartz GN, Calderone HM, Graveel CR, Winn M, Hostetter G, Wells W, and Sempere L. (2014). Stromal expression of miR-21 identifies high-risk group in triple-negative breast cancer. *American Journal of Pathology,* **184(12)**: 3217-25. PMID: 25440114

165. Pearlman D, Brown JR, **MacKenzie T**, Hernandez F, and Najjar S. (2014). Blood levels of S-100 calcium-binding protein B, high-sensitivity C-reactive protein, and interleukin-6 for changes in depressive symptom severity after coronary artery bypass grafting: prospective cohort nested within a randomized, controlled trial. *PLOS ONE,* **9(10)**:e111110. PMID: 25329583

166. Brown JR, Solomon RJ, Sarnak MJ, McCullough PA, Splaine ME, Davies L, Ross C, … **MacKenzie T** and Malenka D. (2015). Reducing Contrast-Induced Acute Kidney Injury Using a Regional Multicenter Quality Improvement Intervention. *Circulation: Cardiovascular Quality and Outcomes,* **7**(5).

167. **MacKenzie T**, Grunkemeier G, Grunwald G, O'Malley AJ, Bohn C, Ying X, and Malenka D. (2015). A Primer on Using Shrinkage to Compare In-Hospital Mortality Between Centers. *Annals of Thoracic Surgery,* **99(3)**:757-61.

168. Morden N, Munson J, Smith J, **MacKenzie T**, Liu S and Tosteson A. (2015). Oral Bisphosphonates and Upper Gastrointestinal Toxicity: A Study of Cancer and Early Signals of Esophageal Injury. *Osteoporosis International,* **26(2)**:663-72. PMID: 25349053

169. Drake KM, Longacre MR, **Mackenzie TA**, Titus LJ, Beach ML, Rundle AG and Dalton MA. (2015). High school sports programs differentially impact participation by sex *Journal of Sport and Health Science,* **4(3):** 282-8.

170. Whedon JM, Song Y, **MacKenzie TA**, Phillips RB, Lukovits TG, and Lurie JD. (2015). Risk of Stroke After Chiropractic Spinal Management in Medicare B Beneficiaries Aged 66 to 99 Years With Neck Pain. *J Manipulative Physiological Therapy,* **38(2)**:93-101.

171. Bekelis K, Missos S, Wong K, **and MacKenzie T.** (2015). The practice of cranial neurosurgery and the malpractice liability environment in the United States. PLOS ONE, 10(3):e0121191. PMID: 25798994

172. Bekelis K, Smith J, Zhou W, and **MacKenzie TA**, Roberts DW, Skinner J, and Morden NE. (2015). Statins and subarachnoid hemorrhage in Medicare patients with unruptured cerebral aneurysms. *International Journal of Stroke,* 10 Suppl A100:38-45. PMID: 26120925

173. Bekelis K, Missios S and **Mackenzie TA.** (2015). The Association of Insurance Status and Race With Transfers of Patients With Traumatic Brain Injury Initially Evaluated at Level III and IV Trauma Centers. *Annals of Surgery,* **262(1):**9-15. PMID: 26020113

174. Rollenhagen C, Macura S, **MacKenzie T**, Lathrop M and Celgf D, and Asin S. (2015). Enhancing Inteferon Regulatory Factor 7 medicated Anti-viral Responses and Decreasing Nuclear Factor Kappa B Expression Limit HIV-1 Replication in Cervical Tissues. *PLOS One, 10(6):e0131919.* PMID: 26121689

175. Bekelis K, Missios S, Coy S, Singer R, **and MacKenzie T.** (2015). New York State: Comparison of treatment outcomes for unruptured cerebral aneurysms using an instrumental variable analysis. *Journal of the American Heart Association,* 4(7). PMID: 26169534

176. Bekelis K, Gottlieb D, Su Y, O'Malley AJ, Labropoulos N, Goodney P **and MacKenzie T.** (2015). Surgical clipping versus endovascular coiling for elderly patients presenting with subarachnoid hemorrhage. *Journal of NeuroInterventional Surgery.* Epub ahead of print. doi: 10.1136/neurintsurg-2015-011890.

177. Bekelis K, Missios S, Rahmani R, **MacKenzie T** and Singer R.J. (2015). Surgical clipping versus endovascular intervention for the treatment of subarachnoid hemorrhage patients in New York State. *PLOS One,* 10(9):e0137946. PMID: 26360422

178. Bekelis K, Gottlieb D, Bovis GK, Su Y, Tjoumakaris S, Jabbour P, **and MacKenzie T.** (2015). Unruptured cerebral aneurysm clipping: the association of combined open and endovascular expertise with outcomes. *Journal of NeuroInterventional Surgery.* Epub ahead of print. doi: 10.1136/neurintsurg-2015-011986.

179. Batsis J, **MacKenzie T**, Bartels SJ, Sahakyan KR, Somers VK, and Lopez-Jimenez F. (2015). Sarcopenia, Sarcopenic Obesity and Functional Impairments in Older Adults: NHANES 1999-2004. *Nutrition Research,* 35(12):1031-1039. PMID: 26472145

180. Batsis J, **Mackenzie T**, Sahakyan K, Somers V, and Lopez-Jimenez F. (2015). Diagnostic Accuracy of Body Mass Index to Identify Obesity in Older Adults: NHANES 1999-2004. *International Journal of Obesity.* Epub ahead of print. doi: 10.1038/ijo.2015.243

181. Root BK, Barrena BG, **Mackenzie TA**, Bauer DF. (2016). Antibiotic Impregnated External Ventricular Drains: Meta and Cost Analysis. *World of Neurosurgery,* 86:306-15. PMID: 26409081

182. Siegel C, Horton H, Siegel L, Thompson K, **MacKenzie T**, Stewart S, Rice P, Stempak J, Dezfoli S, Haritunians T, Levy A, Baek M, MilgromR , Dulai P, Targan S, Silverberg M, Dubinsky M and McGovern D. (2016). A validated web-based tool to display individualized Crohn's disease predicted outcomes based on clinical, serologic and genetic variables. *Alimentary Pharmacology & Therapeutics,* 43(2):262-71.

183. Gifford AH, Dorman DB, Moulton L, Helm JE, Griffin MM **and MacKenzie TA.** (2015). Serum Iron Level is Associated with Time to Antibiotics in Cystic Fibrosis. *Clinical and Translational Science,* 8(6):754-58.

184. Brown JB, **MacKenzie TA**, Maddox TM, Fly J, Tsai TT, Plomondon ME, Nielson CD, Siew ED, Resnic FS, Baker CR, Rumsfeld JS and Matheny M. (2015). Acute Kidney Injury Risk Prediction in Patients Undergoing Coronary Angiography in a National Veterans Health Administration Cohort with External Validation. *Journal of the American Heart Association,* 4:e002136.

185. Bekelis et al, Missos S, **MacKenzie TA**, Labropoulos N, and Roberts DW. (2016). A predictive model of hospitalization cost after cerebral aneurysm clipping. *Journal of NeuroInterventional Surgery,* 8(3):316-22.

186. Bekelis K, Gottlieb D, Labrop N, Su Y, Tjoumakaris S, Jabbour P and **MacKenzie T.** (2016). The impact of hybrid neurosurgeons on the outcomes of endovascular coiling for unruptured cerebral aneurysms. *Journal of Neurosurgery* **126(1):** 29–35.. *26918479*

187. Bekelis K, Missios S, Coy, **MacKenzie T.** (2016). Comparison of outcomes of patients with inpatient or outpatient onset ischemic stroke. *Journal of NeuroInterventional Surgery.* Epub ahead of print. doi: 10.1136/neurintsurg-2015-012145.

188. Bekelis K, Missios S, **MacKenzie T.** (2016). Continuity of care and 30-day readmission for patients evaluated in the emergency room after cerebral aneurysm treatment. *Journal of NeuroInterventional Surgery.* Epub ahead of print. doi:10.1136/neurintsurg-2015-012162

189. Bekelis K, Gottlieb D, Su Y, O'Malley AJ, Labropoulos N, Goodney P **and MacKenzie T.** (in press). Comparison of clipping and coiling in elderly patients with unruptured cerebral aneurysms. *Journal of Neurosurgery.* **126(3)**:811-818

190. **MacKenzie T**, Zaha R, Smith J, Karagas M and Morden N. (2016). Diabetes Pharmacotherapies and Bladder Cancer: A Medicare Epidemiologic Study. *Diabetes Therapy,* 7(1):61-73. PMID: 26894755

191. Bekelis K, Gottlieb DJ, Su Y, Lanzino G, Lawton M **and MacKenzie T.** (in press). Medicare expenditures for elderly patients undergoing surgical clipping or endovascular intervention for subarachnoid hemorrhage. *Journal of Neurosurgery.* **126(3):**805-810

192. Hardy-Fairbanks AJ, **MacKenzie T**, McCarthy M, Goldman MB and Lauria MR (2017) "A Randomized Controlled Trial Comparing Two Types of Retractors at Cesarean Delivery" *The Journal of Gynecology and Obstetrics* **37(8):**1009-1014

193. Bekelis K, Gottlieb D, Su Y, Bovis GK, Lawton M **and MacKenzie T** (2017) "Medicare expenditures for elderly patients undergoing surgical clipping or endovascular intervention for unruptured cerebral aneurysms" accepted *Journal of NeuroInterventional Surgery.* **9(3)**:324-328

194. **MacKenzie T**, Loberg M and O'Malley A.J (2016) "Patient Centered Hazard Ratio Estimation Using Principal Stratification Weights: Application to the NORCCAP Randomized Trial of Colorectal Cancer Screening" *Observational Studies* **2** 29-50

195. JA Batsis, **TA Mackenzie**, J Jones, F Lopez-Jimenez, SJ Bartels. (2016) "Sarcopenia, Sarcopenic Obesity and Inflammation: Results from the National Health and Nutrition Examination Survey 1999-2004" *Clin Nutrition* **35(6):**1472-1483

196. Brown JB, Pearlman D, Marshall E, Alam S, **MacKenzie T**, Recio-Mayoral A, Gomes VO, Kim B, Jensen LO, Mueller C Solomon R (2016) "Meta-Analysis of Individual Patient Data of Sodium Bicarbonate and Sodium Chloride for All-Cause Mortality After Coronary Angiography." *American Journal of Cardiology* **118(10):**1473-1479

197. Goodney PP, Newhall KA, Bekelis K, Gottlieb D, Comi R, Chaudrain S, Faerber AE, **Mackenzie TA**, Skinner JS. (2016) "Consistency of Hemoglobin A1c Testing and Cardiovascular Outcomes in Medicare Patients With Diabetes" *J Am Heart Assoc* **5(8):** e003566

198. Bekelis K, Gottlieb D, Su Y, Labropoulos N, Tjoumakaris S, Jabbour P, **MacKenzie TA** (2016) "Early physician follow-up and out of hospital outcomes after cerebral aneurysm treatment in the elderly." *World of Neurosurgery* 542–547.e1.

199. Bekelis K, Missios S, Coy S, **MacKenzie TA** (2016) "Scope of practice and outcomes of cerebrovascular procedures in children" Childs Nerv Syst. 32(11):2159-2164.

200. Bekelis K, Missios S, **MacKenzie TA**, Tjoumakaris S, Jabbour P. (2017) "Anesthesia technique and outcomes of mechanical thrombectomy in patients with acute ischemic stroke" *Stroke* **48(2):**361-366

201. Goodney PP, Spangler EL, Newhall K, Brooke BS, Schanzer A, Tan TW, Beck AW, Hallett JH**, MacKenzie TA**, Edelen MO, Hoel AW, Rigotti NA, Farber A. "Feasibility and pilot efficacy of a brief smoking cessation intervention delivered by vascular surgeons in the Vascular Physician Offer and Report (VAPOR) Trial**."** *J Vasc* **Surgery 65(4);**1152-60

202. Bekelis K, Calnan D, Simmons N, **MacKenzie TA**, Kakoulides G. (2016) "Effect of an Immersive Preoperative Virtual Reality Experience on Patient Reported Outcomes: A Randomized Controlled Trial."*Ann Surg.* **265(6)**:1068-1073 27906757

203. Batsis J, Emeny R, Lopez-Jiminez F, **MacKenzie T** and Bartels S (2017) "Low Lean Mass with and without Obesity, and Mortality: Results from the 1999-2004 National Health and Nutrition Examination Survey" *J Gerontol A Biol Sci Med Sci.*;**72(10):**1445-1451

204. Bekelis K, Missios Y, **MacKenzie TA**. (2017) ""Outcomes of elective cerebral aneurysm treatment performed by attending neurosurgeons after night work" **82(3)**:329-334 *Neurosurgery*

205. von Reyn CF, Lahey T, Arbeit RD, Landry B, Kailani L, Adams LV, Haynes BC, **Mackenzie T**, Wieland-Alter W, Connor RI, Tvaroha S, Hokey DA, Ginsberg AM, Waddell R. (2017) "Safety and immunogenicity of an inactivated whole cell tuberculosis vaccine booster in adults primed with BCG: a randomized, controlled trial of DAR-901" *PLOS One* **12(5)**:e0175215

206. Bekelis K, Missios S, **MacKenzie TA** (2017) "Association of Magnet status with hospitalization outcomes for ischemic stroke patients" *Journal of the American Heart Association* **6(4)** e005880

207. Bekelis K, Missios S, Coy S, Rahmani R, **MacKenzie TA**, Asher AL. (2017) "Correlation of Subjective Hospital Compare Metrics With Objective Outcomes of Cranial Neurosurgical Procedures in New York State." *Neurosurgery*. **80(3)**:401-408

208. Bekelis K, Missios S, **MacKenzie TA** (2017) "Access disparities to Magnet hospitals for ischemic stroke patients" *Journal of Clinical Neuroscience* **43**: 68–71.

209. Batsis B, **Mackenzie T**, Vasquez E, Germain C, Emeny R, Rippberger P, Lopez-Jimenez F, and Bartels S "Association of Adiposity, Telomere Length and Mortality: Data from the NHANES 1999-2002" *International Journal of Obesity* **42(2):**198-204

210. Rippberger P, Emeny RT, **Mackenzie TA**, Bartels SJ, Batsis JA () "The Association of Sarcopenia, Telomere Length and Mortality: Data from the NHANES 1999-2002" *European Journal of Clinical Nutrition* **72(2):**255-263

211. Crow RS, Lohman MC, Titus AJ, Bruce ML, **MacKenzie TA**, Bartels SJ and Batsis JA "Mortality Risk along the Frailty Spectrum: Data from NHANES 1999-2004" *JAGS* **66(3)**:496-502

212. Sorscher A, Anzivino A and **MacKenzie** T (2018) "Patient-Predicted Sleep Position vs. HST data: A Tendency to Underestimate Supine Sleep" *Sleep and Breathing* https://doi.org/10.1007/s11325-017-1589-z

213. Martínez-Camblor P; **MacKenzie TA**; Staiger DO, Goodney PP and O'Malley J (2018) "Adjusting for bias introduced by instrumental variable estimation in the Cox Proportional Hazards Model" *Biostatistics* https://doi.org/10.1093/biostatistics/kxx062

214. Taenszer, Perread, **MacKenzie**, McGrath (2018) "Characteristics of Desaturation and Respiratory Rate in Postoperative Patients Breathing Room Air vs. Supplemental Oxygen - Are they Different?" *Anesthesia & Analgesia* **126(3):**826-832

215. diFlorio Alexander RM, Haider SJ, **MacKenzie T**, Goodrich ME, Weiss J, Onega T "Correlation between Obesity and Fat-infiltrated Axillary Lymph Nodes Visualized on Mammography"*British Journal of Radiology* https://doi.org/10.1259/bjr.20170110

216. Bekelis K, Missios S and **MacKenzie TA** (2017) "Correlation of hospital Magnet status with the quality of physicians performing neurosurgical procedures in New York State" *British Journal of Surgery* **32(1)**:13-17

217. Weeks WB, Ouayogodé MHL, Ventelou B, **MacKenzie T**, Weinstein JN. "Community economic distress and changes in Medicare patients[1] end-of-life care costs" *Journal of Palliative Medicine*

218. Columbo J, Martinez-Camblor P, MacKenzie TA, Kang R, Trooboff SW, Goodney PP, O'Malley AJ (2018) "A Comparative Analysis of Long-Term Mortality After Carotid Endarterectomy and Carotid Stenting," *Journal of Vascular Surgery*

219. Brooks, J. M., Titus, A. J., Bruce, M. L., Orzechowski, N. M., **MacKenzie, T. A**., Bartels, S. J., & Batsis, J. A. (2018). "Depressive symptoms and handgrip strength among U.S. adults aged 60 years and older from NHANES 2011-2014". *The Journal of Nutrition, Health, and Aging*.

220. Jacobs JP, Alam SS, Owens SL, Parker DM, Rezaee M, Likosky DS, Shahian DM, Jacobs ML, Thiessen-Philbrook H, Wyler von Ballmoos M, Lobdell K, **MacKenzie T**, Everett AD, Parikh CR, Brown JR. "The Association between Novel Biomarkers and 1-year Readmission or Mortality after Cardiac Surgery" *Ann Thorac Surg*

221. Susan P. McGrath, Irina Perreard, Melissa Garland, Kelli Converse and **Todd Mackenzie** "Improving patient safety and clinician workflow in the general care setting with enhanced surveillance monitoring" *IEEE Journal of Biomedical and Health Informatics*

222. Bekelis K, Missios S, Sju J, **MacKenzie TA**, Mayerson B "Surgical outcomes for patients diagnosed with dementia: A coarsened exact matching study" *Journal of Clinical Neurosciences*

223. Lobdell KW, Parker DM, Likosky DS, Rezaee M, Wyler von Ballmoos M, Alam SS, Owens S, Thiessen-Philbrook H, **MacKenzie T**, Brown JR "Preoperative serum ST2 level predicts acute kidney injury after adult cardiac surgery." *Journal of Thoracic Cardiovascular Surgery*

224. Wihbey KA, Joyce EM, Spalding ZT, Jones HJ, **MacKenzie TA**, Evans RH, Fung JL, Goldman MB, Erekson EProphylactic Negative Pressure Wound Therapy and Wound Complication After Cesarean Delivery in Women With Class II or III Obesity: A Randomized Controlled Trial *Obstetrics & Gynecology*

225. Columbo J, Martinez-Camblor P, Goodney P, **MacKenzie TA**, O'Malley AJ"Comparing long-term mortality after carotid endarterectomy versus carotid stenting using a novel instrumental variable method for risk-adjustment in observational time-time-to event data"accepted *JAMA Network Open*

226. **MacKenzie T**, O'Malley James and Bekelis K "Reporting of Baseline Characteristics to Accompany Analysis by Instrumental Variables" accepted *Epidemiology*

Expert Report of Todd MacKenzie

Exhibit B: Materials Considered

Bates Number	Document
MS-00004708	DMH FY 17 - FY 19 Strategic Plan Mid-Year Progress Report.pdf
MS-00019187	FYE 2018.pdf
MS-00027320	Impact Statement 2016.pdf
MS-00033123	DMH Economic Impact 11-09-2016.pdf
MS-00044515	STF 2016 Economic Impact.pdf
MS-00044518	CMRC Final Impact 2016.doc
MS-00076771	SMSH Final Impact 2016.docx
MS-00108902	DMH FY16 Annual Report Final.pdf
MS-ROGS-00000127	EMSH Interrogatory 5
MS-ROGS-00000130	Interogatory 1-EMSH- 2 North Unit
MS-ROGS-00000131	Interrogatory 1- EMSH-4 South Unit
MS-ROGS-00000132	Interrogatory 1-EMSH-3 North Unit
MS-ROGS-00000133	Interrogatory 1-EMSH-3 South Unit
MS-ROGS-00000134	Interrogatory 1-EMSH-4 North Unit
MS-ROGS-00000137	Interrogatory 1-MSH Response
MS-ROGS-00000144	Interrogatory 5 - MSH Response
MS-ROGS-00000158	Interrogatory 1 NMSH
MS-ROGS-00000162	Interrogatory 5 - October 23, 2017 NMSH
MS-ROGS-00000166	SMSH Interrogatory 5
MS-ROGS-00000168	SMSH Interrogatory Number 1
MS-ROGS-00000171	EMSH Justification for Missing Data Points
MS-ROGS-00000172	EMSH- Interrogatory #1- 2-North Unit
MS-ROGS-00000173	EMSH- Interrogatory #1- 3 North Unit
MS-ROGS-00000174	EMSH- Interrogatory #1- 3-South Unit
MS-ROGS-00000175	EMSH -Interrogatory #1 4-South Unit
MS-ROGS-00000176	Interrogatory #1- 4 North Unit
MS-ROGS-00000177	Interrogatory 1 MSH Response -with LOS and Adm Number
MS-ROGS-00000178	Interrogatory 1 MSH Response-active at start - with Prior admit LOS
MS-ROGS-00000179	MSH explanation of the 2 files that were submitted
MS-ROGS-00000180	20171121 2017 Fed Int Report 2.xlsx
MS-ROGS-00000181	SMSH Explanation
MS-ROGS-00000182	SMSH Interrogatory Number 1A
USDOJ-0000503	2016-2017-Plan-FINAL.pdf
USDOJ-0000589	2015.09 White Paper Highlights.pdf
USDOJ-0000614	Mississippi - A Statewide Approach for Integrated Supportive Housing.pdf
USDOJ-0000624	Peer Report #511 (2008).pdf
USDOJ-0000813	TAC Adult Services Draft Report.pdf
USDOJ-0000815	2017.08.01 Progress-Update-on-Mississippis-Public-Mental-Health-System-August-2017.pdf
USDOJ-0000818	Final-Master-2016-Operational-Standards-for-Distribution-6-17-16.pdf
USDOJ-0000887	2015 Report on Hospitals.pdf
USDOJ-0000915	DMH-FY16-Annual-Report.pdf
USDOJ-0000951	10a Progress Update on Mississippi's Public Mental Health System.pdf
USDOJ-0001328	DMH-FY17-Annual-Report.pdf
USDOJ-0005860	DMH FY18-20 Annual Report
USDOJ-0008428	Draft MS Client Review Sample with Interview Status
USDOJ-0008431	MS Review Sample with Interview Status
USDOJ-0010737	Descriptive Statistics Dec 08 2017
	Complaint, *United States of America v. State of Mississippi*
	Data Wrangling with R (Use R!/Springer) 1st ed. 2016 Edition by Bradley C. Boehmke Ph.D.
	Draft MS Client Review Sample with Interview Status 0619

Expert Report of Todd MacKenzie

Exhibit B: Materials Considered

	http://www.dmh.ms.gov/service-options/community-mh-centers/
	Kish, Leslie. "Survey Sampling" (1965) Wiley classics
	MS Review Sample with Interview Status 7.23
	Review for reducing hosps_6-2-18
	State of Mississippi's Response to United States' First Interrogatories
	Statement of the Deparmtnet of Justice on Enforcement of the Integration Mandate of Title II of the Americans with Disabilities Act and Olmstead v. L.C., https://www.ada.gov/olmstead/q&a_olmstead.htm
	United States' First Interrogatories to State of Mississippi

Descriptive Statistics

Patients in hospital in the period between Oct 15 2015 and Oct 15 2017.

5070 admissions from 3951 patients after exclusions: Admissions were excluded if they were lacking SSN, birthdate, had admission date out of range, a discharge date that preceded the admission date or exceeded the date on which the data was prepared. The number of admissions excluded was 277 (5% of the original 5347). In addition we excluded admissions from patients in "chemical dependency" units.

514 patients admitted exactly twice during the period, 147 had exactly three, and 82 had four or more admissions

Descriptive Statistics: Admissions (N=5070)

By **Hospital/Unit**

EMSH2N	EMSH3N	EMSH3S	EMSH4N	EMSH4S	MSH	NMSH	SMSH
161	174	230	176	104	2172	749	1304

By **Hospital**

	N	Percentage
EMSH	845	16.7
MSH	2172	42.8
NMSH	749	14.8
SMSH	1304	25.7
Total	5070	100.0

Age

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	missing's
18.01	28.90	38.16	40.64	51.75	83.40	14

Gender

	N	Percentage
F	1857	36.6
M	3213	63.4
Total	5070	100.0

Race

	N	Percentage
White	2056	40.6
Black	2944	58.1
Other	69	1.4
Total	5069	100.0

- Race missing for 1 patient

Diagnosis*

	N	Percentage
Schizophrenia	1506	30.6
Schizoaffective	431	8.8

Psychosis	362	7.4
Bipolar	776	15.8
Major Depressive	292	5.9
Substance	152	3.1
Other	1563	31.7

- Diagnosis was missing for 145 (2.9%) of the admissions
- Some individuals have more than one of these diagnoses

Number of Prior Admissions

	N	Percentage
0	2478	49.1
1	934	18.5
2	453	9.0
3	297	5.9
4+	885	17.5
Total	5047	100.0 (missing for 23)

CMHC Region

	N	Percentage
1	130	2.6
2	270	5.4
3	222	4.4
4	245	4.9
6	491	9.8
7	276	5.5
8	376	7.5
9	577	11.5
10	581	11.6
11	503	10.0
12	681	13.6
13	369	7.3
14	207	4.1
15	93	1.9
Total	5021	100.0 - Missing for 49

	Length of Stay (Days)			
Hospital	1-20	21-60	61-180	181+
EMSH	74	388	256	126
MSH	675	849	417	231
NMSH	256	394	97	0
SMSH	618	604	78	1

Admission or discharge date missing for 6 patients.

Descriptive Statistics: Patient at First Admission (N=3951)

By **Hospital/Unit**

EMSH2N	EMSH3N	EMSH3S	EMSH4N	EMSH4S	MSH	NMSH	SMSH
148	156	206	149	82	1682	531	997

By Hospital

	N	Percentage
EMSH	741	18.8
MSH	1682	42.6
NMSH	531	13.4
SMSH	997	25.2
Total	3951	100.0

	N	Percentage
F	1489	37.7
M	2462	62.3
Total	3951	100.0

Age

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
18.01	29.04	38.30	40.67	51.71	83.40	12

Race

	N	Percentage
White	1681	42.6
Black	2213	56.0
Other	56	1.4
Total	3950	100.0

- Race missing for 1 patient

Diagnosis*

	N	Percentage
Schizophrenia	1106	28.8
Schizoaffective	312	8.1
Psychosis	321	8.4
Bipolar	609	15.9
Major Depressive	270	7.0
Substance	132	3.4
Other	1221	31.8

- Diagnosis was missing for 112 (2.8%) of the admissions
- Some individuals have more than one of these diagnoses

Number of Prior Admissions

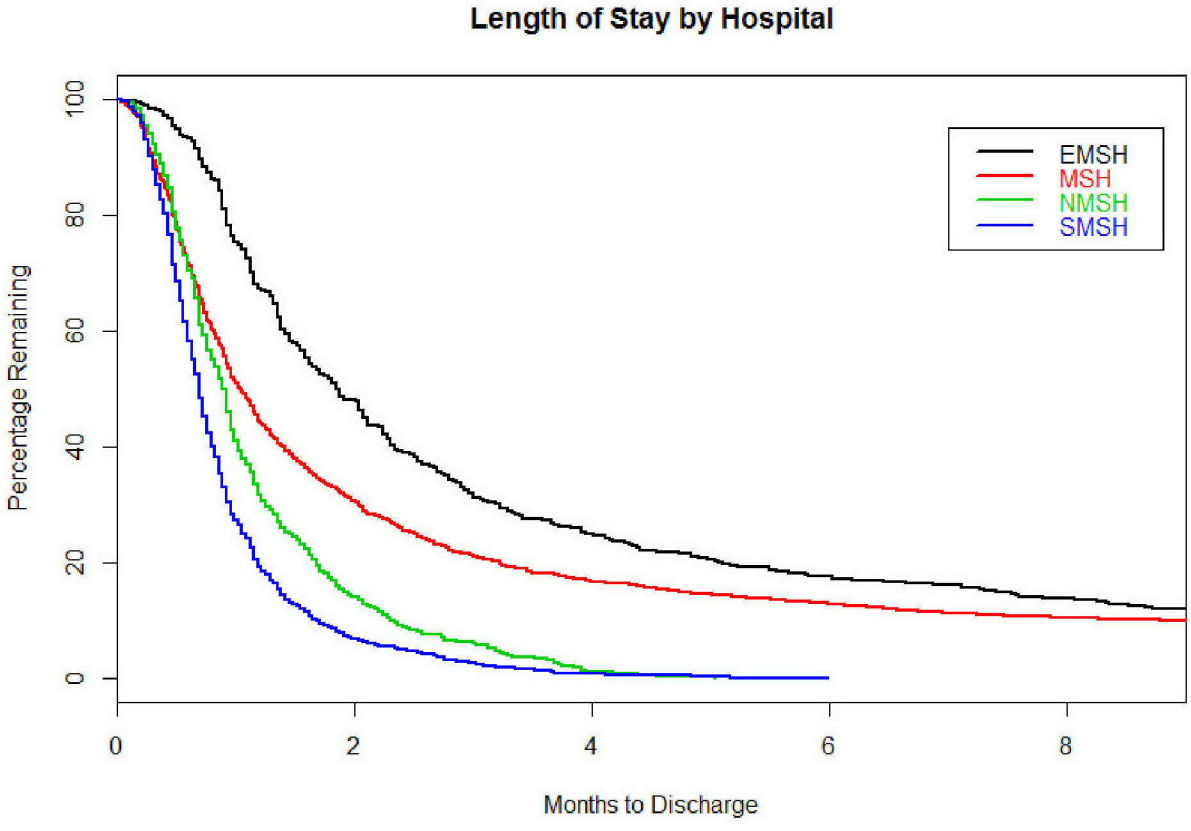
	N	Percentage
0	2127	54.1
1	693	17.6
2	323	8.2
3	212	5.4
4+	576	14.7
Total	3931	100.0

- Missing for 20 patients

	Length of Stay (Days)			
Hospital	1-20	21-60	61-180	181+
EMSH	69	349	210	113

MSH	544	640	293	205
NMSH	191	277	62	0
SMSH	502	442	51	1

- Missing for 2 patients



Precision of Estimates Resulting from a Completed Sample of Given Size from each Strata

Pts per strata	Total Pts	Margin of Error for 95% Confidence
60	240	7.2
50	200	7.9
40	160	8.8
30	120	10.4

These margins of error were calculated taking into account the stratified sampling scheme, of equal numbers of subjects from each of the 4 categories for length of stay in days, 1-20, 21-60, 61-180, 181+, for which the respective frequencies in the population of patients who stayed in a state hospital during the period Oct 2015 to Oct 2017 were 33%, 43%, 16% and 8%. Accordingly the margin of error is 1.96*sqrt((0.33^2 * p1(1-p1)/n1 + 0.43^2 * p2(1-p2)/n2 + 0.16^2 * p3(1-p3)/n3 + 0.08^2 * p4(1-p4)/n4) where pi is the frequency of interest in strata i and ni is the number of subjects sample from strata i. The table above sets the sample sizes per strata to be equal and assumes the most conservative (highest possible variance) value for the p's, p1=p2=p3=p4=0.5.